

## REMARKS

Reconsideration and allowance of this application are respectfully requested. Claims 1-3, 5-23, 25-28, and 31-34 remain pending, where claims 4, 24, 29, and 30 were previously cancelled. By this communication, the title of the application and claims 1, 2, 5, 9, 12, 13, 15, 31 and 32 are amended, and claim 34 is added. Support for the amended subject matter can be found, for example, in original claim 4.

Beginning on page 2 of the Office Action, the Examiner objected to the title of the invention, and claims 1, 9, and 12 for alleged informalities. Applicants respectfully traverse these objections. However, in an effort to expedite prosecution the title and the claims are amended for clarity. Because this rejection is now moot, its withdrawal is respectfully requested.

On page 3 of the Office Action, claim 12 is rejected under 35 U.S.C. §112, second paragraph, for alleged indefiniteness. Applicants respectfully traverse this rejection. However, in an effort to expedite prosecution claim 12 is amended for clarity. Therefore, withdrawal of this rejection is respectfully requested.

Beginning on page 4 of the Office Action, claims 1, 2, 5, 6, 9-15, 25, and 31-33 stand rejected under 35 U.S.C. §103(a) for alleged unpatentability over *Plante* (U.S. Patent No. 4,655,563) in view of *Clemino* (U.S. Patent No. 4,670,338). Applicants respectfully traverse this rejection.

Contrary to the Examiner's assertions, the combination of the *Plante* and *Clemino* patents fails to establish a *prima facie* case of obviousness with respect to Applicants' claims. The Examiner alleges that the *Plante* patent discloses every element recited in Applicants' claims except for the flexible or compliant features of

Applicants' claimed support and relies on the teaching of an epoxy type glue in the *Clemino* patent in an effort to remedy this deficiency. This hypothetical combination, however, falls short of disclosing the combination of features recited in Applicants' claims.

Applicants challenge the Examiner's alleged findings of fact with respect to *Plante*.

On page 4 of the Office Action, the Examiner asserts that the "top sheet 10" described in *Plante* is an example of a self-deforming mirror. However, Applicants could find no features or characteristics in the top sheet 10 that would cause the reflective surface of the top sheet 10 to deform. Thus, it appears that a more prudent interpretation of the *Plante* patent would "find" that the top sheet 10 is not a self-deforming mirror.

*Plante* defines a deformable mirror (see column 2, line 63 to column 3, line 28) as comprising a top sheet 10 and a lower sheet 12 linked by a number of electrodistortive actuators 18 and associated buttons 16. The actuators 18 may be selectively actuated to distort the top sheet 10 and hence to distort the reflective surface thereon. One of ordinary skill would understand that collectively these four features 10, 12, 16, and 18 are the minimum set required to form a self-deforming mirror. Stated differently, the top sheet 10 in and of itself does not embody a "self-deforming" characteristic. Applicants respectfully submit that it is improper to ignore *Plante's* guidance on the constituent elements of a deformable mirror, and doing so is highly suggestive of hindsight reasoning by the Examiner.

*Plante* describes that the buttons 16 are contained within the deformable mirror structure. As discussed above, elements 10, 12, 16, and 18 are established

as the minimum components of the self-deforming mirror. Therefore, because the buttons are included in the self-deforming structure, they cannot also support the self-deforming structure. Applicants respectfully submit, therefore, that the buttons 16, cannot form a supporting structure for the self-deforming mirror.

*Plante* discloses, at column 3, line 49 onwards, that "[p]referably the deformable mirror is supported by three pairs of bi-pod mounts,..." On page 7 of the Office Action, the Examiner argues that the buttons described in *Plante* are passive support elements. Applicants disagree. Each bi-pod mount 20 comprises a pair of variable length actuators 22, 24. One of ordinary skill would recognize that the bi-pod mounts are not "passive" support structures since they include "variable length actuators." In Figure 4, *Plante* shows an alternative support arrangement in which the deformable mirror is supported by long-stroke actuators 28. In neither embodiment is the self-deforming mirror supported by a passive flexible support structure. Rather, both of the described structures are in fact active supports designed to further deform or tilt the deformable mirror.

For convenience, the Examiner appears to dissect the deformable mirror structure of *Plante* in order to find features which might correspond to features of the passive flexible support structure recited in Applicants' claims. However, a more prudent and reasonable interpretation would follow the guidance provided in *Plante* on the features that make up the deformable mirror and the features that act as "supports" for the deformable mirror. The Examiner's dissection of the apparatus of *Plante* is entirely inconsistent with the teachings of *Plante* and hence with the understanding taken by one of ordinary skill.

On page 5 of the Office Action, the Examiner alleges that the epoxy glue of *Clemino* serves as evidence of flexibility in the support structure buttons 16 of *Plante*. Applicants disagree because the glue of *Clemino* is used as a bonding mechanism. One of ordinary skill would understand that the glue is not thick enough to perform the sort of mechanical function suggested by the Examiner. The Examiner's suggestion of using epoxy as the principle flexing member is inconsistent with the accepted and well-known application of this material. Applicants respectfully submit that the disclosed role of the buttons 16 of *Plante* is to couple the deforming forces of the actuators 18 to the top sheet 10 as effectively as possible - not to somehow reduce the deformation through the absorption of stresses as alleged by the Examiner. Outside of the teachings in Applicants' own disclosure, there appears to be no reasonable or rational basis to combine these references in order to achieve the claimed results.

Applicants respectfully submit that one of ordinary skill would not have looked to combine the teachings of *Plante* and *Clemino*. The structure of *Clemino* is designed to prevent distortion of the mirror, and the apparatus of *Plante* is designed with two tiers of deforming actuators to distort the mirror in every way possible.

In summary, the *Plante* and *Clemino* patents when applied individually or in combination as alleged by the Examiner, fail to disclose or suggest the combination of features recited in Applicants' claims. The Office is reminded that the Office has the initial burden of establishing a **factual basis** to support the legal conclusion of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). For rejections under 35 U.S.C. § 103(a) based upon a combination of prior art elements, in KSR Int'l v. Teleflex Inc., 127 S.Ct. 1727, 1741, 82 USPQ2d 1385,

1396 (2007), the Supreme Court stated that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some **articulated reasoning with some rational underpinning** to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (emphasis added). For at least the foregoing reasons, withdrawal of this rejection is respectfully requested.

Claim 34 is newly added and depends indirectly from claim 1. By virtue of this dependency, and particularly, the reasons discussed in detail with respect to claim 1 above, Applicants respectfully submit that this claim is likewise distinguishable over the prior art of record. Favorable consideration is requested.

### **Conclusion**

Based on at least the foregoing amendments and remarks, Applicants submit that claims 1-3, 5-23, 25-28, and 31-34 are allowable, and this application is in condition for allowance. In the any issues remain, the Examiner is invited to contact the undersigned attorney.

Respectfully submitted,

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